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## **1.0 Background**

Kolberg-Pioneer Inc. (Kolberg) is a manufacturing facility for rock crushers, conveyors, and associated construction and industrial equipment. Structural and plate steel is welded and painted at the facility. The Standard Industrial Classification code for this facility is 3531.

On February 22, 1999, Kolberg was issued Title V air quality operating permit #28.9906-07 for the operation of three paint spray booths and one air make-up unit at its manufacturing facility located in Yankton, South Dakota.

The permit was modified in May 2001 to include an additional paint spray booth (Unit #5). The modified permit placed an emission limit and recordkeeping requirements for hazardous air pollutants on the additional booth, exempting Unit #5 from a case-by-case MACT determination.

The permit was modified and renewed in March 2006 to include the installation of two additional paint booths and associated air make-up units.

On December 22, 2009, Kolberg submitted an application to modify its existing permit to include other processes generating particulate matter that were not previously identified in its permit. These processes include two plasma arc cutting tables, welding hoods, shot blast system and a plasma punch.

On March 22, 2010, the department received an application from Kolberg to modify their permit again by installing a heat treating “Stress Relief” furnace vented outdoors.

On April 19, 2011, Kolberg submitted an application to renew its Title V air quality operating permit. The application was considered complete on May 23, 2011. The review of the existing equipment and changes to operations resulted in Kolberg being considered eligible for a minor air quality operating permit. The draft permit is currently open for public comments.

On July 6, 2011, Kolberg submitted an application to construct a powder coating system. The application was considered complete on July 13, 2011. It was determined by the department that the powder coating system did not require Kolberg to obtain a construction permit.

### **1.1 Proposed Project**

On January 27 and February 9, 2012, Kolberg submitted applications to revise the application as follows:

1. Install a 2012 Alltra/Hypertherm plasma burn table with particulate emissions controlled by a 2011 Donaldson Torit baghouse;
2. Decommission the Small Part Booth (Unit #3);
3. Decommission the air make-up unit for the South Paint Booth which is currently considered an insignificant activity; and

4. Install the air make-up unit for the Small Part Booth (Unit #4) on the South Paint Booth. The air make-up unit is a 1994 Hastings air make-up unit with a maximum heat input of 4.7 million Btus per hour and fired with natural gas.

The applications were considered complete on February 27, 2012.

## 1.2 Existing Operations

Table 1-1 provides a description of the permitted units, operations, and processes identified in Kolberg's draft minor air quality operating permit.

**Table 1-1 Description of Permitted Units, Operations, and Processes**

<b>Unit</b>	<b>Description</b>	<b>Control Device</b>
<b>#1</b>	North Booth – 1992 Texaspray air assist – airless paint booth. The paint booth uses a manual method of spraying.	Dry filter pads will control overspray
<b>#2</b>	South Booth – 1977 Trimatic air assist – airless paint booth, model number TM-1888018-FLI. The paint booth uses a manual method of spraying.	Dry filter pads will control overspray
<b>#3</b>	Small Parts Booth – 1994 Custom paint booth. The paint booth uses an air assisted airless, manual method of spraying.	Dry filter pads will control overspray
<b>#4</b>	Small Parts Paint Booth air make-up unit – 1994 Hastings air make up unit, model SBD-277-40-4696, serial number 47754. The unit has a heat input capacity of 4.70 million Btus per hour and operates on natural gas.	Not Applicable
<b>#5</b>	2000 Logan Valley Paint Booth. The paint booth uses an air assisted airless, manual method of spraying.	Dry filter pads will control overspray
<b>#6</b>	Conveyor Booth - 2006 Diamond Vogel/Colmet paint booth, model number TDD-1818-100 DT. The paint booth will use an air assisted-airless, manual method of spraying.	Dry filter pads will control overspray
<b>#7</b>	Fast Track Booth - 2006 Diamond Vogel/Colmet paint booth, model number TOD-2218-80 DT. The paint booth will use an air assisted-airless, manual method of spraying.	Dry filter pads will control overspray
<b>#8</b>	Conveyor paint booth air make-up unit – The unit has a heat input capacity of 9.50 million Btus per hour and operates on natural gas.	Not Applicable
<b>#9</b>	Fast track paint booth air make-up unit – The unit has a heat input capacity of 9.72 million Btus per hour and operates on natural gas	Not Applicable
<b>#10</b>	ALLTRA Hi-Definition Burn Table HPR 260.	2004 Donaldson-Torit 24-bag baghouse
<b>#11</b>	ALLTRA Burn Table HPR 260.	2007 Farr GS-16 16-bag baghouse.
<b>#17</b>	Whitney 661-84 Plasma Punch.	1993 Donaldson-Torit TD-3-99 3-bag

Unit	Description	Control Device
		baghouse.
#18	Baker Stress Relief Furnace - The unit has a heat input capacity of 5.3 million Btus per hour and operates on natural gas.	Not Applicable

### 1.3 Insignificant Activities

The previous Statements of Basis exempted the following units:

1. South paint booth air make-up unit – Hastings air make up unit, model LB-35C, serial number 6760. The unit has a heat input capacity of 3.0 million Btus per hour;
2. North paint booth air make-up unit – 1987 King National, model DFOC 225B HBR, serial number 87-DF-3438. The unit has a heat input capacity of 3.9 million Btus per hour; but the potential emissions from the unit are less than two tons per year of hazardous air pollutants or any criteria pollutant;
3. Middle paint booth air make-up unit – Hastings model SBDHT-277-45-4250, serial number 57383. The unit has a heat input capacity of 4.3 million Btus per hour; but the potential emissions from the unit are less than two tons per year of hazardous air pollutants or any criteria pollutant;
4. Metal fabrication, treating, and coating;
5. Six head cutting torch with a heat input capacity of 0.3 million Btus per hour;
6. Heat treating furnace with a heat input capacity of 2.2 million Btus per hour;
7. Welding area air handler with a heat input capacity of 1.7 million Btus per hour;
8. Torrit baghouse for metal shot blasting booth – emits indoors;
9. Lab – sieve analysis, baghouse with potential emissions of less than two tons per year;
10. Space heating;
11. Drying room furnace with a heat input capacity of 1.3 million Btus per hour;
12. Small parts loading area furnace with a heat input capacity of 1.3 million Btus per hour;
13. Electrical department furnace with a heat input capacity of 1.3 million Btus per hour; and
14. 65 radiant heaters – collective heat input capacity 8.0 million Btus per hour (varying heat input capacities of not more than 0.1 million Btus per hour).
15. Material Testing Laboratory baghouse. 36 bags. Unknown manufacturer & date.
16. Hoffman Shotblast System. Compressed air shotblasting system with emissions controlled by a 1994 Donaldson-Torit 54-bag baghouse.
17. Welding area. Emissions controlled by a 1990 Donaldson-Torit 4DF48 48 bag baghouse.
18. Wheelabrator shotblast furnace. Natural gas fired furnace. Rated at 3 MMBtu/hr heat input.
19. Wheelabrator shotblast system. Emissions from the shotblast system are controlled by a 2007 reverse air baghouse with 113 bags.

## **2.0 New Source Performance Standards**

The department reviewed the New Source Performance Standards and determined the proposed construction project is not applicable to any standards under 40 CFR Part 60.

## **3.0 New Source Review**

In accordance with ARSD 74:36:10:01, the new source review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. This facility is located near Mina, South Dakota, which is in attainment or unclassifiable for all the criteria air pollutants regulated under the Clean Air Act. Therefore, Kolberg is not subject to new source review.

## **4.0 Prevention of Significant Deterioration**

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated air pollutant. The following is a list of regulated air pollutants under the PSD program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM<sub>10</sub>);
3. Particulate with a diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>);
4. Sulfur dioxide (SO<sub>2</sub>);
5. Nitrogen oxides (NO<sub>x</sub>);
6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Fluorides
10. Sulfuric acid mist;
11. Hydrogen sulfide;
12. Reduced sulfur compounds;
13. Total reduced sulfur; and
14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated air pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated air pollutant, except for greenhouse gases.

According to the Clean Air Act, once a pollutant is regulated under any part of the Act, (as was the case with greenhouse gas emissions after the motor vehicle regulations were finalized in March 2010) major new sources or major modifications are subject to the PSD program and Title V air quality operating permit program. Under the Clean Air Act, PSD and Title V air quality operating permits are required for all sources that emit a regulated air pollutant above 100 or

250 tons per year, depending on the source. This threshold, if applied to greenhouse gases, would greatly increase the number of facilities requiring a PSD review or Title V air quality operating permit. Based on administrative necessity, EPA increased these thresholds through the “Tailoring Rule.”

On May 13, 2010, EPA issued the final version of the “Tailoring Rule” for greenhouse gas emissions. The major source threshold for greenhouse gases is listed below:

1. New PSD source because of a criteria air pollutant, the major source threshold for greenhouse gases is 75,000 tons per year of carbon dioxide equivalent or more;
2. New PSD source if greenhouse gas emissions are 100,000 tons per year of carbon dioxide equivalent or more;
3. For an existing PSD source because of a criteria air pollutant, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more;
4. For an existing non-PSD source that has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more; and
5. In addition to subsection (2) and (4), a specific greenhouse gas, without calculating the carbon dioxide equivalent, also needs to emit greater than 100 or 250 tons per year, whichever is applicable, to be regulated.

#### 4.1 Potential Emissions from Existing Sources

In the statement of basis associated with the permit renewal that is currently being processed, the department calculated the potential emissions from the permitted units in Table 1-1. The potential particulate matter (PM), particulate matter less than 10 microns (PM10), carbon monoxide (CO), volatile organic compound emissions (VOC), sulfur dioxide (SO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>) and carbon dioxide emissions are shown in Table 4-1.

**Table 4-1 – Potential Emissions Summary (tons per year)**

Unit	PM	PM10	PM2.5	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	CO <sub>2</sub>
<b>#1-#3 and #5-#9</b>	0.8	0.8	0.8	0.1	10.6	45.8	8.8	9,700
<b>#4</b>	0.2	0.2	0.2	0.0	2.0	0.1	1.7	2,420
<b>#10</b>	4.6	4.6	4.6	0.0	1.5	0.0	0.0	0.0
<b>#11</b>	4.6	4.6	4.6	0.0	1.5	0.0	0.0	0.0
<b>#12</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>#13</b>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>#14</b>	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
<b>#15</b>	0.1	0.1	0.1	0.0	1.3	0.7	0.0	0.0
<b>#16</b>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>#17</b>	7.7	7.7	7.7	0.0	4.2	0.0	0.0	0.0
<b>#18</b>	0.2	0.2	0.2	0.0	2.3	0.1	1.9	2,730
<b>Total =</b>	<b>19</b>	<b>18</b>	<b>18</b>	<b>0</b>	<b>23</b>	<b>47</b>	<b>12</b>	<b>14,850</b>

The department assumed the particulate matter less than 2.5 microns (PM2.5) emissions were

equivalent to PM10 emissions.

#### 4.2 Potential Emissions from Proposed Project

The proposed project consists of adding a new plasma cutting system and replacing the existing air make-up unit from the South Paint Booth with the air make-up unit for the Small Parts Paint Booth (Unit #4). There will be no change in emissions from this unit.

Kolberg submitted fume emission testing data conducted by Hypertherm in February 1999. The study quantified the emissions of particulate matter, nitrogen oxide and various metals emitted when cutting metal on the ALLTRA Burn Tables and with the Whitney Plasma Punch. Table 4-2 summarizes the emission factors in pounds per hour. Equation 4-1 and the emission factors from Table 4-2 will be used to calculate the annual emissions. The potential emissions from the new plasma cutting system and existing operations are summarized in Table 4-3.

##### *Equation 4-1 – Potential Emissions from plasma cutting system*

$E = \text{Emission Factor} \times 8,760 \text{ hours per year} / 2,000 \text{ pounds per ton}$

**Table 4-2 - Plasma Cutting Emission Factors (pounds per hour)**

Unit	PM/PM10/PM2.5	NO <sub>x</sub>
#19	1.39	0.331

#### 4.3 Potential Emissions from Facility

Table 4-3 summarizes the annual emissions for Kolberg considering both the existing operations and the new plasma cutting system.

**Table 4-3 – Facility Potential Emissions (tons per year)**

Unit	PM	PM10	PM2.5	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	CO <sub>2</sub>
Existing Equipment	19	18	18	0	23	47	12	14,850
New Plasma System	6	6	6	0	1	0	0	0
<b>Total =</b>	<b>25</b>	<b>24</b>	<b>24</b>	<b>0</b>	<b>24</b>	<b>47</b>	<b>12</b>	<b>14,850</b>

Kolberg is not considered one of the 28 named PSD source categories; therefore, the major source threshold under the PSD program is 250 tons per year. The major source threshold for greenhouse gases is 100,000 tons per year. Kolberg's air emissions from its existing operations and the addition of the new plasma cutting system do not exceed the 250 tons per year and does not meet the major source threshold for greenhouse gases. Therefore, Kolberg is considered a minor source under the PSD program and is not subject to PSD requirements.

#### 5.0 National Emission Standards for Hazardous Air Pollutants

The department reviewed the national emission standards for hazardous standards and determined the proposed construction project is not applicable to any standards under 40 CFR Part 61.



## 6.0 Maximum Achievable Control Technology Standards

### 6.1 Potential HAP Emissions

The federal Maximum Achievable Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is defined as having the potential to emit 10 tons or more per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants.

In the statement of basis associated with the permit renewal that is currently being processed, the department calculated the potential hazardous air pollutant emissions from the permitted units in Table 1-1. The potential hazardous air pollutant emissions are shown in Table 6-1.

**Table 6-1 – Potential Hazardous Air Pollutant Emissions (tons per year)**

Unit	Xylene <sub>1</sub>	Total HAPs
#1-#3 and #5-#9	2.4	3.3
#4	0.0	0.0
#10	0.0	0.1
#11	0.0	0.1
#12	0.0	0.0
#13	0.0	0.0
#14	0.0	0.0
#15	0.0	0.0
#16	0.0	0.0
#17	0.0	0.1
#18	0.0	0.0
<b>Total =</b>	<b>2</b>	<b>4</b>

<sup>1</sup> - Xylene is the greatest single HAP emitted from the facility.

Kolberg submitted fume emission testing data conducted by Hypertherm in February 1999. The study quantified the emissions of various metals emitted when cutting metal on the ALLTRA Burn Tables and with the Whitney Plasma Punch. The emission factor for total hazardous air pollutant is 0.0193 pounds per hour. Equation 4-1 and the total hazardous air pollutant emission factor will be used to calculate the annual emissions. The potential emissions from the new plasma cutting system and existing operations are summarized in Table 6-2.

**Table 6-2 – Potential Hazardous Air Pollutant Emissions with Plasma Cutting System**

Unit	Xylene <sub>1</sub>	Total HAPs
Existing Equipment	2.0	4.0
New Plasma Cutting System	0.0	0.1
<b>Total =</b>	<b>2</b>	<b>4</b>

<sup>1</sup> - Xylene is the greatest single HAP emitted from the facility.

Kolberg is considered an area source of hazardous air pollutant emissions based on its potential hazardous air pollutant emissions. DENR reviewed the Maximum Achievable Control Technology (MACT) standards under 40 CFR Part 63 and determined the following need to be reviewed further to determine if they are applicable.

## **6.2 ARSD 74:36:08:119 – 40 CFR Part 63, Subpart XXXXXX**

DENR reviewed the national emission standards and determined the plasma cutting table may be applicable to 40 CFR Part 63, Subpart XXXXXX. The MACT standard is for the control of hazardous air pollutants for nine metal fabrication and finishing area source categories. The provisions of this subpart are applicable to an area source that is primarily engaged in the operations in one of the following nine source categories:

1. Electrical and Electronic Equipment Finishing Operations (NAICS codes 335999 and 335312);
2. Fabricated Metal Products (NAICS codes 332117 and 332999);
3. Fabricated Plate Work (Boiler Shops) (NAICS codes 332313, 332410, and 332420);
4. Fabricated Structural Metal Manufacturing (NAICS code 332312);
5. Heating Equipment, except Electric ((NAICS code 333414);
6. Industrial Machinery and Equipment Finishing Operations (NAICS codes 333120, 333132 and 333911);
7. Iron and Steel Forging (NAICS code 33211);
8. Primary Metal products Manufacturing (NAICS code 332618); and
9. Valves and Pipe Fittings (NAICS code 332919).

Kolberg has a Standard Industrial Classification Code of 3531 and a North American Industry Classification System code of 333120. Kolberg is one of the nine operations applicable to this subpart.

This subpart applies to sources using abrasive blasting, machining operations, dry grinding/dry polishing, spray painting, and welding activities. This subpart regulates the emissions of metal fabrication or finishing metal hazardous air pollutants – these operations are conducted prior to and are not associated with the operation of the plasma cutting table. Although Kolberg is applicable to this subpart, the subpart is not applicable to the plasma cutting table.

## **6.3 Other MACT Standards**

DENR reviewed the other Maximum Achievable Control Technology Standards and determined there are no other standards applicable to the proposed construction project.

## 7.0 State Requirements

Any source constructing in South Dakota that meets the requirements of the ARSD 74:36:20:01 is required to obtain an air quality construction permit. An air quality construction permit is required of all new sources or modifications to existing sources. The proposed addition of the plasma cutting system will increase air emissions above the insignificant levels; therefore, the proposed project is required to obtain an air quality construction permit before starting construction. On March 1, 2012, Kolberg notified the department that it qualified for initiating construction prior to permit issuance as specified in ARSD 74:36:20:02.01. Based on this review, the department agrees.

### 7.1 State Particulate Emission Limits

ARSD 74:36:06:02(1) and 74:36:06:03(1), establish state emission limits for total suspended particulate matter. In addition, ARSD 74:36:12:01 establishes a visible emission limit of 20 percent opacity for each unit.

In accordance with ARSD 74:36:06:03(01)(a), the allowable particulate emission rate for process industry units with process weight rates up to 60,000 pounds per hour shall be determined by Equation 7-1:

***Equation 7-1 – State’s particulate emission limit***

$$E = 4.10 \times P^{0.67}$$

Where:

- E= the rate of emissions in pounds per hour; and
- P= process weight rate in tons per hour

Table 7-1 compares Kolberg’s potential particulate emissions to the state’s particulate emission limit.

***Table 7-1 - Comparison of Allowable and Uncontrolled Particulate Emissions***

<b>Unit</b>	<b>Process Weight Rate (tons per hour)</b>	<b>Allowable Particulate Emission Rate (lbs/hr)</b>	<b>Uncontrolled Particulate Emission Rate (lbs/hr)</b>
<b>#19</b>	10.2	19.4	1.4

### 7.2 State Sulfur Dioxide Emission Limits

In accordance with ARSD 74:36:06:02(2) and ARSD 74:36:06:03(2), the permitted units may not emit sulfur dioxide emissions to the ambient air in an amount greater than three pounds of sulfur dioxide per million Btus of heat input. The sulfur dioxide emission limit is not applicable to proposed project.

### **7.3 Performance Tests**

ARSD 74:36:06:06 states that stack testing may be required for units with potential emissions greater than 100 tons per year of a regulated pollutant or at the discretion of the Secretary. Kolberg will not be required to conduct a stack performance test at this time because the potential emission rate is less than 10 percent of the state's particulate emission limit. The current permit contains language that allows DENR to require a stack performance test during the term of the permit if an investigation of the facility warrants it.

### **8.0 Recommendation**

Based on the above findings, Kolberg is required to obtain an air quality construction permit for the proposed project and construct and operate within the requirements stipulated in the following regulations:

1. ARSD 74:36:06 – Regulated air pollutant emissions;
2. ARSD 74:36:11 – Performance testing;
3. ARSD 74:36:12 – Control of visible emissions; and
4. ARSD 74:36:20 – Construction permits for new sources or modifications.

Based on the information submitted in the air quality permit application, DENR recommends conditional approval to construct the plasma burn table. Any questions pertaining to this permit recommendation should be directed to Keith Gestring, Engineer II, at 605-677-6165.